

**REMARKS**

Claim 2 and claim 5 have been cancelled, claims 1, 3, 8, 14 and 16 have been amended, and claim 18 has been added. Claims 1, 3, 4, 6 – 8, 14 - 16 and 18 are pending in the present application. Careful reconsideration in view of the following amendments and remarks are respectfully requested. It is most respectfully submitted that claims 1, 3, 4, 6 – 8, 14 - 16 and 18 are in condition for allowance. Early reconsideration and allowance are most respectfully requested.

**Claims Objections:**

The Office Action objects to Claim 5 under 37 CFR §1.75(c) on the assertion that such claim is of improper dependent form for failing to further limit the subject matter of a previous claim. In response, claim 5 has been cancelled. Accordingly, this rejection is rendered moot.

**Claims Rejections - 35 USC §102:**

In the Office Action, claims 1 - 8 and 14 - 17 were rejected under 35 U.S.C. §102(b) as allegedly being anticipated by Buchanan, Jr. et al. (U.S. Statutory Invention Registration No. H. 40). These rejections are most respectfully traversed, as follows.

**a. The Present Claim Amendments**

In this response, claim 2 has been cancelled and independent claims 1, 8,

14 and 16, as now amended, each incorporate certain unique and advantageous features related to first or second reverse-conduction type semiconductor material being "**buried**" in "**trenches**."

In this regard, independent claim 1 has been amended to include the features from claim 2 (i.e., such that claim 1 is parallel to former claim 2 in independent form) and now recites "a plurality of first reverse-conduction type semiconductor regions comprising **buried** reverse-conduction type semiconductor material **in trenches** having an orthohexagonal shape formed in the semiconductor layer," claim 8 has been amended so as to be in independent form and recites "wherein the second reverse-conduction type semiconductor region comprises buried semiconductor material in a plurality of trenches formed in the semiconductor layer," independent claim 14 now recites "at least one reverse-conduction type semiconductor region, each designed to have an orthohexagonal shape and **buried in at least one trench** in the semiconductor layer," and independent claim 16 recites "a plurality of first reverse-conduction type semiconductor regions, each designed to have an orthohexagonal shape **buried in trenches** in the semiconductor layer." In addition, dependent claim 3 is now amended to cosmetically enhance the wording of the claim for better readability of the claim, and, hence, such amendment should not in any way limit the broadest reach of the claim under the doctrine of equivalents.

**b. The Deficiencies of the Buchanan, Jr. et al. Reference**

Buchanan, Jr. et al. does not teach or suggest the use of "buried semiconductor material." In contrast, the Buchanan, Jr. et al. reference involves "one or more field shield diffusions at the metal-semiconductor interface." See

Column 2, lines 23 - 25. Notably, Buchanan, Jr. et al. refers to diffused material many times (e.g. Column 2, lines 39 - 48 and lines 65 - 68; Column 3, lines 42 - 45; Column 3, line 59 - Column 4, line 4; Column 4, lines 30 - 42 and Column 5, lines 14 - 18 and lines 35 - 37), but never mentions nor teaches "buried" semiconductor material, as recited in certain claims of the present application.

The desirability of having material "buried in trenches" was emphasized throughout the present application. See, for example, page 16, lines 1 - 7, page 26, lines 1 - 2 and page 28, lines 15 - 17 of the present application, which explain that "polysilicon 3b doped with P<sup>+</sup>-type impurities [by way of example and not limitation] is **preferably** buried in all trenches 3a."

The Buchanan, Jr. et al. reference does not teach or suggest, among other things, a "trench" and "reverse conduction type semiconductor" material (such as, e.g., polysilicon) "buried" in such a trench.

In addition, by diffusing impurities in the material (such as, e.g., polysilicon) buried in the trench, a fine processing can be used. Accordingly, the preferred embodiments have significant advantages over the Buchanan, Jr. et al. reference. See, e.g., claim 3.

Accordingly, all of the independent claims should be allowable over the Buchanan, Jr. et al. reference. In addition, the dependent claims, which should be allowable for similar reasons as being dependent on respective independent claims, also recite additional combinations of features that are not disclosed or suggested by the references.

**Concluding Remarks:**

In view of the foregoing, it is most respectfully submitted that all of the presently pending claims are allowable. Early reconsideration and withdrawal of the rejections are respectfully requested. The Examiner is respectfully requested to indicate the allowance of the claims in the next paper from the Office.

The undersigned representative requests any extension of time that may be deemed necessary to further the prosecution of this application. The undersigned representative authorizes the Commissioner to charge any additional fees under 37 C.F.R. 1.16 or 1.17 that may be required, or credit any overpayment, to Deposit Account No. 14-1437.

In order to facilitate the resolution of any issues or questions, the Examiner is requested to contact the undersigned by telephone.

Respectfully submitted,



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